

**THAT WHICH IS CLAIMED IS:**

1. A bioprosthesis comprising:  
a tissue having an elastin content of at least about 10% by weight  
of the tissue; and  
5 a support material attached to the tissue.
2. The bioprosthesis of claim 1, in which the tissue has an elastin  
content of greater than about 30% by weight of the tissue.
3. The bioprosthesis of claim 1, wherein the tissue is an anisotropic  
tissue.
- 10 4. The bioprosthesis of claim 3, wherein the anisotropic tissue exhibits  
greater stiffness in a first direction and greater elasticity in a second direction.
5. The bioprosthesis of claim 1, wherein the tissue is vena cava  
tissue.
6. The bioprosthesis of claim 5, wherein the vena cava tissue is  
15 porcine vena cava tissue.
7. The bioprosthesis of claim 1, wherein the support material  
comprises a stent.
8. The bioprosthesis of claim 1, wherein the support material  
comprises a suture ring.
- 20 9. The bioprosthesis of claim 1, wherein the bioprosthesis is a  
bioprosthetic heart valve.
10. A bioprosthetic heart valve comprising:  
a fixed tissue having an elastin content of at least about 10% by  
weight of the tissue; and  
25 a support structure selected from the group consisting of a suture  
ring and a stent.
11. The bioprosthetic heart valve of claim 10, wherein the tissue has an  
elastin content of at least about 30% by weight of the tissue.
12. The bioprosthetic heart valve of claim 10, wherein the tissue is  
30 vena cava tissue.

13. The bioprosthetic heart valve of claim 10, wherein the tissue is porcine vena cava tissue.

14. The bioprosthetic heart valve of claim 10, wherein the bioprosthetic heart valve is a tricuspid heart valve.

5 15. The bioprosthetic heart valve of claim 10, wherein the bioprosthetic heart valve is a bicuspid heart valve.

16. A process for forming a bioprosthesis comprising:  
providing a flat tissue having an elastin content of at least about 10%;

10 excising a portion of the flat tissue; and  
attaching the portion to a support material of the bioprosthesis.

17. The process of claim 16, wherein the flat tissue is an anisotropic material, and the excised portion of the flat tissue exhibits greater stiffness in a first direction and greater elasticity in a second direction.

15 18. The process of claim 17, wherein the excised portion of the flat tissue is formed in the shape of a heart valve leaflet, the direction of greater elasticity of the excised portion being substantially equivalent to the center-most radius of the heart valve leaflet.

19. The process of claim 17, wherein the excised portion of the flat  
20 tissue is formed in the shape of a heart valve leaflet.

20. The process of claim 19, wherein the heart valve leaflet is a tricuspid valve leaflet.

21. The process of claim 19, wherein the heart valve leaflet is a bicuspid valve leaflet.

25 22. The process of claim 16, wherein the bioprosthesis is a bioprosthetic heart valve.

23. The process of claim 16, wherein the support material comprises a suture ring.

24. The process of claim 16, wherein the flat tissue is vena cava tissue.

25. The process of claim 24, further comprising obtaining a section of vena cava, and opening the section of vena cava with a longitudinal incision to form a flat tissue.
- 5 26. The process of claim 24, wherein the vena cava is porcine vena cava.
27. The process of claim 16, further comprising chemically fixing the tissue.
28. A process for replacing a damaged cardiac valve comprising:  
10 surgical removal of a damaged cardiac valve from the heart of a patient;  
implantation of a bioprosthetic heart valve in the cardiac valve annulus, wherein the bioprosthetic heart valve comprises a fixed tissue having an elastin content of at least about 10% by weight of the tissue and a support structure selected from the group consisting of a suture ring and a stent; and  
15 attachment of the bioprosthetic heart valve to the tissue of the cardiac valve annulus.
29. The process of claim 28, wherein the tissue has an elastin content of at least about 30% by weight of the tissue.
30. The process of claim 28, wherein the tissue is vena cava tissue.
- 20 31. The process of claim 30, wherein the tissue is porcine vena cava tissue.
32. The process of claim 28, wherein the bioprosthetic heart valve is a tricuspid heart valve.
33. The process of claim 28, wherein the bioprosthetic heart valve is a  
25 bicuspid heart valve.